

## Cautions of LSR line

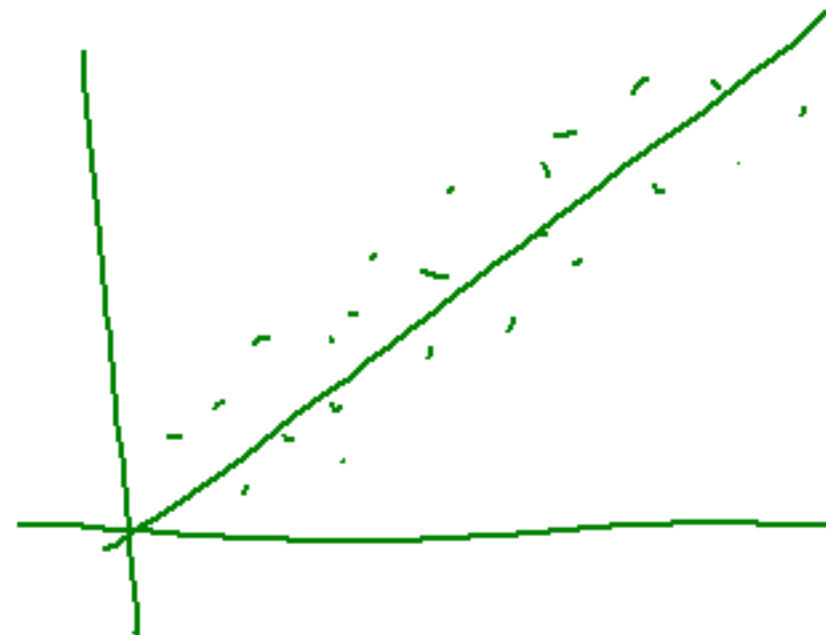
Residuals (errors):

= actual - predicted (from LSR line)

$$= y_i - \hat{y}_i$$

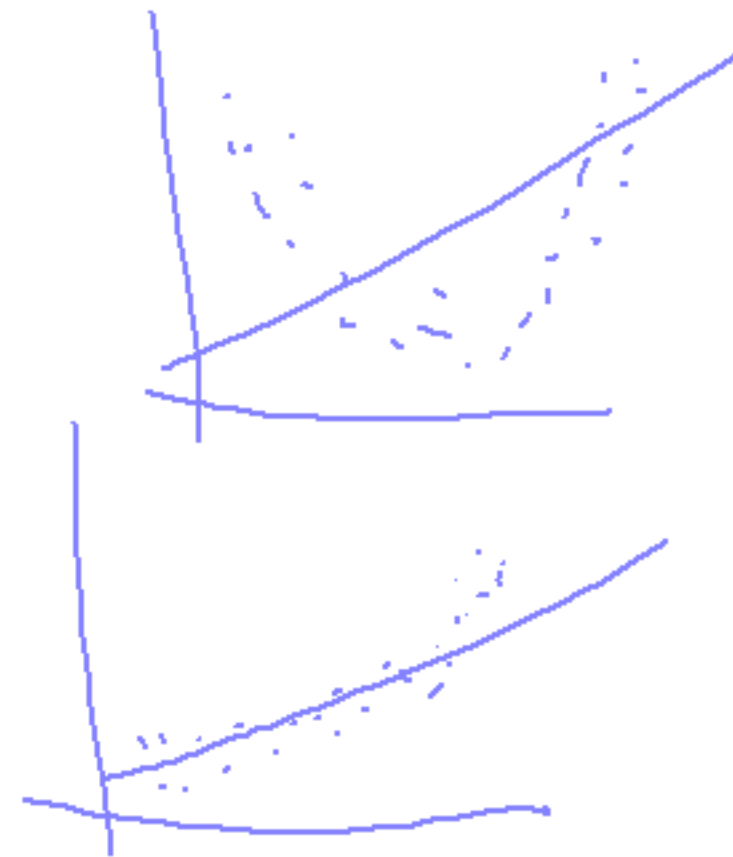
$$\sum \text{residuals} = 0$$

$$\bar{x}_{\text{residuals}} = 0$$



## Residual Plot:

- Definition: **scatterplot of explanatory variable vs. residuals** <sup>(x-var)</sup> <sub>(y-var)</sub>
- Helps... *US see if LSR line is a good fit for plot.*
- No pattern = *scattered = good fit*
- Pattern = *another model (form) would be better*
- Can show...
  - Lurking variables =

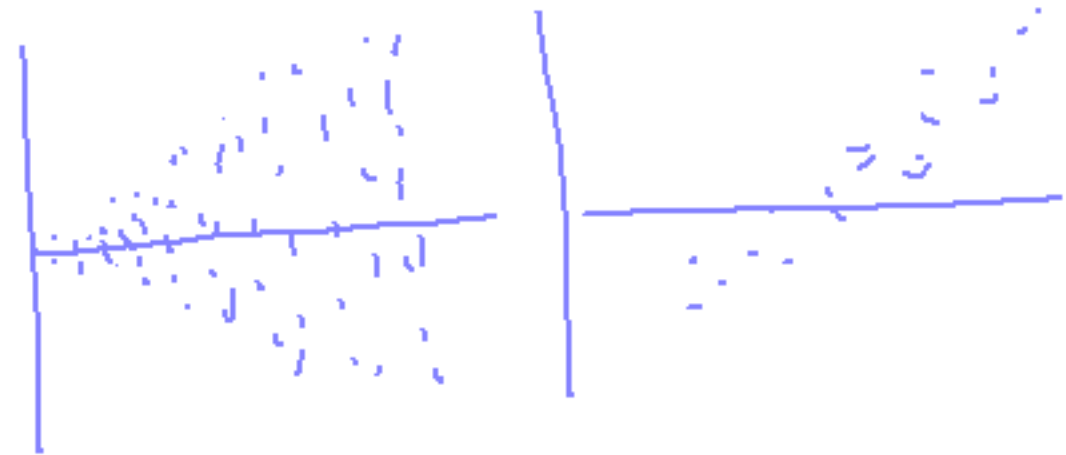


on calculator:

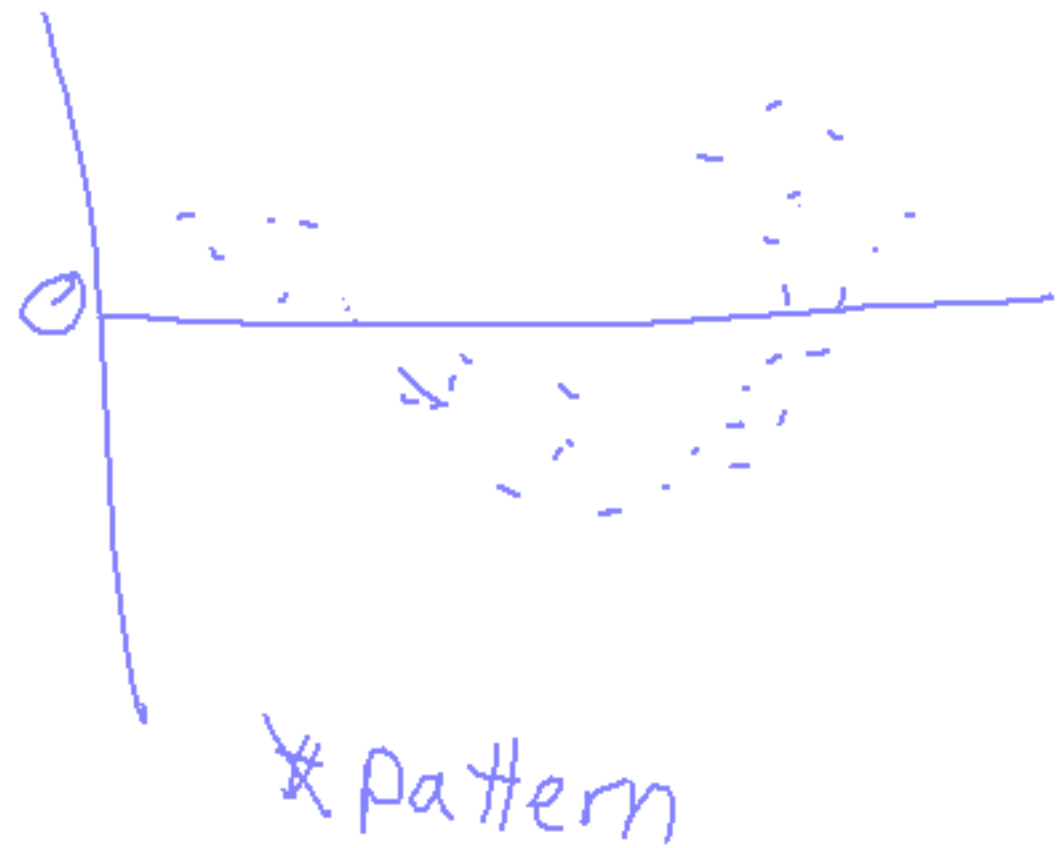
Plots:



Line -  
Good fit



Line - bad fit



<i>Regression Statistics</i>				
Multiple R	0.883620846			
R Square	0.780785799			
Adjusted R Square	0.763923168			
Standard Error	1.311483261			
Observations	15			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-1.73106061	2.04612023	-0.84602	0.4128433
Minutes	0.549242424	0.080716215	6.80461	1.25E-05

What is the equation of the LSR line relating minutes spent and policies sold.

What is the value of  $r$ ? What is the value of  $r^2$ ?

*Interpret the slope in the context of the problem?*

The following is a MINITAB regression printout relating average number of degree-days per month to gas consumption (in cubic feet).

Predictor	Coef	StDev	T	P
Constant	123.24	28.60	4.31	0.004
Degree-d	20.221	1.145	17.66	0.000

S= 43.45      R-sq = 97.8%      R-sq(adj) = 97.5%

1. What is the equation of the LSR line relating degree days to gas consumption?
2. What is the value of  $r$ ? What is the value of  $r^2$ ?
3. Interpret the slope in the context of the problem?